WHAT IS CLAIMED IS:

1. A chimeric polypeptide comprising:

a virus coat polypeptide sequence and a viral receptor polypeptide sequence, wherein the coat polypeptide sequence and the receptor polypeptide sequence are linked by a spacer, and wherein the coat polypeptide sequence and the viral receptor polypeptide sequence bind to each other.

2. The chimeric polypeptide of claim 1, wherein the virus is a virus having an envelope polypeptide.

3. The chimeric polypeptide of claim 1, wherein the virus is a virus that binds a co-receptor polypeptide.

4. The chimeric polypeptide of claim 1, wherein the virus is an immunodeficiency virus.

5. The chimeric polypeptide of claim 4, wherein the immunodeficiency virus is selected from the group consisting of HIV, SIV, FIV, FeLV, FPV, and herpes virus.

6. The chimeric polypeptide of claim 5, wherein the HIV is HIV-1 or HIV-2.

7. The chimeric polypeptide of claim 5, wherein the HIV is a macrophage tropic or a lymphocyte tropic HIV.

8. The chimeric polypeptide of claim 2, wherein the envelope polypeptide comprises a gp120 polypeptide sequence.

9. The chimeric polypeptide of claim 8, wherein the gp120 polypeptide sequence lacks 60 amino acids from the amino terminus and 20 amino acids from the carboxyl terminus.

10. The chimeric polypeptide of claim 1, wherein the receptor is a CD4 polypeptide sequence.

11. The chimeric polypeptide of claim 10, wherein the CD4 polypeptide sequence comprises the D1 and D2 domains.

~~12. The chimeric polypeptide of claim 1, wherein the spacer is an amino acid sequence.~~

13. The chimeric polypeptide of claim 1, wherein the spacer has from about 5 to about 200 amino acids.

14. The chimeric polypeptide of claim 1, wherein the spacer has from about 10 to about 100 amino acids.

15. The chimeric polypeptide of claim 1, wherein the spacer has from about 15 to about 50 amino acids.

16. The chimeric polypeptide of claim 1, wherein the spacer has from about 20 to about 40 amino acids.

~~17. The chimeric polypeptide of claim 1, wherein the spacer comprises a peptidomimetic sequence.~~

18. The chimeric polypeptide of claim 1, further comprising a heterologous domain.

19. The chimeric polypeptide of claim 18, wherein the heterologous domain is selected from the group consisting of: a tag, an adhesin, and an immunopotentiating agent.

20. The chimeric polypeptide of claim 18, wherein the heterologous domain comprises an amino acid sequence.

21. The chimeric polypeptide of claim 20, wherein said amino acid sequence is a c-myc polypeptide sequence.

22. The chimeric polypeptide of claim 19, wherein said immunopotentiating agent is an immunoglobulin polypeptide sequence.

23. The chimeric polypeptide of claim 22, wherein said immunoglobulin polypeptide sequence is a heavy-chain polypeptide sequence.

24. The chimeric polypeptide of claim 1, further comprising a pharmaceutically acceptable carrier.

25. A polynucleotide sequence comprising a nucleic acid sequence encoding the chimeric polypeptide of claim 1.

26. The polynucleotide sequence of claim 25, further comprising an expression vector.

27. A host cell containing the expression vector of claim 26.

28. The polynucleotide sequence of claim 25, further comprising a pharmaceutically acceptable carrier.

29. An antibody or functional fragment thereof that binds to the chimeric polypeptide of claim 1.

30. The antibody of claim 29, wherein the antibody neutralizes the virus *in vitro*.

31. The antibody of claim 29, wherein the antibody inhibits virus infection.

32. The antibody of claim 29, wherein the antibody binds to an epitope produced by the binding of the virus coat polypeptide sequence and the receptor polypeptide sequence.

33. The antibody of claim 32, wherein the epitope is present on an envelope polypeptide sequence.

34. ~~A method for producing an antibody that binds to the~~ chimeric polypeptide of claim 1, comprising administering the ~~chimeric~~ polypeptide of claim 1 to a subject, or a polynucleotide ~~that encodes~~ the chimeric polypeptide of claim 1, in an amount ~~sufficient for the subject to produce antibody to the~~ chimeric polypeptide of claim 1.

Sub a3

35. A method for inhibiting virus infection in a subject comprising administering to the subject an effective amount of the chimeric polypeptide of claim 3, or a polynucleotide encoding the chimeric polypeptide of claim 3, to inhibit virus infection of a cell expressing a virus co-receptor polypeptide, thereby inhibiting virus infection.

36. The method of claim 35, wherein the virus is an immunodeficiency virus.

37. The method of claim 35, wherein the subject is a human.

38. A method for producing an immune response to a virus in a subject comprising administering to the subject an effective amount of the chimeric polypeptide of claim 1, or a polynucleotide that encodes the chimeric polypeptide of claim 1, to produce an immune response to the virus.

39. The method of claim 38, wherein the virus is an immunodeficiency virus.

40. The method of claim 38, wherein the subject is a human.

41. The method of claim 38, wherein the immune response comprises an antibody response.

42. The method of claim 41, wherein the antibody binds to an epitope produced by the binding of the virus coat polypeptide sequence and the receptor polypeptide sequence.

43. The method of claim 41, wherein the antibody neutralizes the virus *in vitro*.

44. The method of claim 38, wherein the immune response comprises a CTL response.

45. The method of claim 36, wherein the immunodeficiency virus is HIV.

46. A method for identifying an agent that inhibits an interaction between a virus and a virus co-receptor comprising the steps of:

(a) contacting the chimeric polypeptide of claim 3 with a virus co-receptor under conditions allowing the chimeric polypeptide and the co-receptor to bind, in the presence and absence of a test agent; and

(b) detecting binding in the presence and absence of the test agent, wherein decreased binding in the presence of the test agent thereby identifies an agent that inhibits binding between the virus and the virus co-receptor.

Sub. a4

47. The method of claim 46, wherein the virus is an immunodeficiency virus.

48. The method of claim 47, wherein the immunodeficiency virus is HIV.

49. The method of claim 46, wherein the test agent is added after contacting the chimeric polypeptide with the virus co-receptor.

50. The method of claim 46, wherein the test agent is added before contacting the chimeric polypeptide with the virus co-receptor.

51. The method of claim 46, wherein the test agent is a library of agents.

52. The method of claim 46, wherein the test agent is selected from the group consisting of a peptide, an organic molecule, an antibody, an antiviral, an immunodeficiency virus co-receptor or functional fragment thereof.

53. The method of claim 47, wherein the immunodeficiency virus co-receptor is a CCR5 or CXCR4 polypeptide sequence.

54. The method of claim 46, wherein the virus co-receptor is present on the surface of an intact cell.

55. The method of claim 54, wherein the intact cell is present in an animal.

56. The method of claim 55, wherein the animal is a non-human primate.

57. A method for identifying an agent that inhibits an interaction between a virus and a virus receptor comprising the steps of:

(a) contacting the chimeric polypeptide of claim 1 with a test agent; and

(b) detecting binding between the virus coat polypeptide sequence and the viral receptor polypeptide sequence, wherein a decreased amount of binding in the presence of the test agent identifies an agent that inhibits binding between the virus and the virus receptor.

58. The method of claim 57, wherein the virus is an immunodeficiency virus.

59. The method of claim 58, wherein the immunodeficiency virus is HIV.

60. The method of claim 57, wherein the test agent is added after contacting the chimeric polypeptide with the virus receptor polypeptide.

61. The method of claim 57, wherein the test agent is added before contacting the chimeric polypeptide with the virus receptor polypeptide.

62. The method of claim 57, wherein the test agent is a library of agents.

63. The method of claim 57, wherein the test agent is selected from the group consisting of a peptide, an organic molecule, an antibody, an antiviral, an immunodeficiency virus receptor or functional fragment thereof.

64. The method of claim 58, wherein the immunodeficiency virus receptor polypeptide is a CD4 polypeptide sequence.

65. The method of claim 57, wherein the virus receptor polypeptide is present on the surface of an intact cell.

66. A method for identifying a chimeric polypeptide sequence that inhibits virus infection of a cell comprising the steps of:

(a) contacting a cell susceptible to virus infection with an infectious virus particle in the presence and absence of the chimeric polypeptide sequence of claim 1; and

(b) determining whether the chimeric polypeptide inhibits virus infection of the cell, thereby identifying a chimeric polypeptide sequence that inhibits virus infection.

67. The method of claim 66, wherein the virus is an immunodeficiency virus.

68. The method of claim 67, wherein the immunodeficiency virus is HIV.

69. The method of claim 66, wherein the chimeric polypeptide sequence is added after contacting the cell with the infectious virus particle.

70. The method of claim 66, wherein the chimeric polypeptide sequence is added before contacting the cell with the infectious virus particle.

71. The method of claim 66, wherein the method is performed in an animal.

72. The method of claim 71, wherein the animal is a non-human primate.

5

add B37